

# Black Potts Weir

## FLOOD ALLEVIATION SCHEME



Case Study | Winter 2022



# INTRODUCTION

Lynch is proud to be working with BAM Nuttall on the Environment Agency's River Thames flood alleviation scheme.

The Jubilee River is a man-made river, which was built by the Environment Agency and opened in 2002. The river is 11.6km long, with 326 hectares of wildflower grasslands to encourage new species and 193 hectares of native woodland planted.

This is part of a flood alleviation scheme which protects approximately 3,200 homes from flooding. Since its construction, the weirs on the river have been opened over 30 times to reduce the flood risk from the River Thames.

Black Potts is one of the six weirs along the river, that helps to keep the water at the same level as the River Thames. Divers had previously spotted scouring - water damage caused by erosion.

The Black Potts Weir repairs is part of a framework for the EA, and this will ensure protection of the weir and railway bridge for up to 100 years.



# LOCATION



The works were very close to Windsor Castle in Home Park. Works needed to demobilise, and all machines were brought back to the compound on the day of the Queen's horse show. We flew flags at half-mast and there was a stand down day for Prince Phillip's funeral.

The site compound was in Home Park, but the site itself was on a barge in the Jubilee River and was only accessible by vessel. Machines needed to be delivered to work on a barge in the river.

As we were working in the water from the barge, we used bio-oil on all machines. This is non-hazardous or toxic if spilled and much safer for the natural environment around the river.

## KEY STATISTICS

**100 YEARS**

PROTECTION FOR THE WEIR AND RAILWAY BRIDGE

**2800+ TONNE**

ROCK ARMOUR STONE PLACED TO PROTECT THE WEIR FROM FUTURE EROSION

**360**

ROCK BAGS PLACED

**3,200**

PROPERTIES IN MAIDENHEAD, WINDOR, ETON AND COOKHAM WITH REDUCED FLOOD RISK

**2,132**

LYNCH OPERATED HOURS ON THIS PROJECT

**15**

MACHINES WENT OUT ON HIRE

# WORKING WITH



# TECHNOLOGY

## GPS MACHINE CONTROL

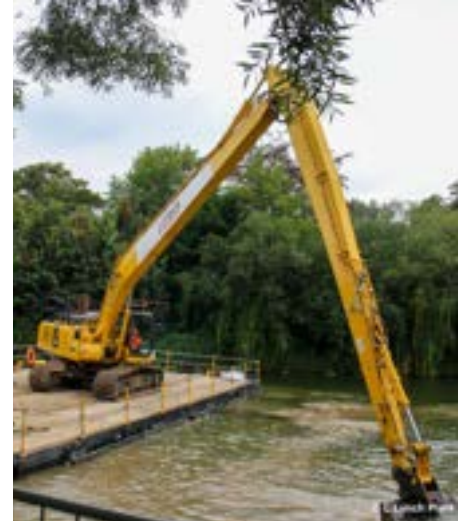
GPS Machine Control was used for placing rock armour bags underwater to protect the riverbed from further erosion. Usually, a scuba team would be required, and this could take months.

We used a 22T Long Reach Excavator, fitted it with a machine control dredging upgrade kit that allows the machine to work underwater. A hook attachment was then calibrated in place of a typical bucket allowing for accurate placement of rock armour bags. The 50T Excavator used for moving the rocks was also fitted with machine control and a grab attachment was calibrated in place of a bucket, allowing accurate rock placement underwater.

A simple model was then created with points specifying the location of the centre of each rock armour bag, this allowed the operator to highlight a point and the GPS would guide him to correct bag location underwater. The technology also allowed the operator to capture as-built data for each bag placed and report this data back to the engineering team remotely via a cloud-based service.

GPS Machine Control technology was important as it helped us to get the job done right first time. This reduced any need for rework as the Machine Control was able to provide the Operator and site engineers with instant feedback.

**THE LONG REACH WAS ABLE TO FINISH WORKS 6 WEEKS AHEAD OF SCHEDULE.**



# TRAINING & CONNECTIVITY

Full training on the GPS Machine Control Technology was given to the Operators and the site engineers, to ensure we got the very best out of the system. James King, Technical Support Manager, trained the operator to review the As-Built data, showing exactly where he had placed the rock armour bags in real time. This helped with accuracy and saved the need for a scuba team going under water.

James also spent time with the team on site, interacting with the system and setting up the models. The project team were shown how access and process data and upload new models to the system. We also provided training on correctly setting up the base station every morning, to ensure this could be moved and secured at the end of each working day.



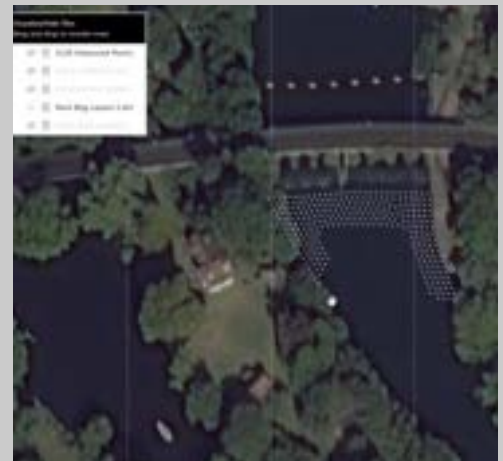
# CONNECTIVITY

Early engagement was key to the success of the project and the Machine Control Team spent time preparing before the project kicked off.

We used the cloud based ConX system which allowed us to easily collaborate and share information with the team on site, allowing us manage and monitor the construction data in real time.

The remote support software allowed all project team members to see the location of the machines, see the time frames and see the models that they are working towards. Data sharing allowed the site teams to download the As-Built data and process this through the system.

The ConX system also saved downtime and our engineers from driving to site, because an engineer could diagnose and fix faults remotely through the system.



# HEALTH AND SAFETY

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A survey of the topography of the riverbed saved a lot of manual work, negated the need for a scuba team of divers to assist with accurate positioning of the rock armour bags. This increased safety as we were not putting anyone in the water when they didn't have to be.

We were also able to provide remote assistance where needed, which meant that Lynch fitters didn't need to be on site, working around machinery.



# ENVIRONMENT

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The Long Reach was able to finish works 6 weeks ahead of schedule. As well as time saving, this would have led to cost savings and most importantly fuel savings: reducing emissions and helping to lower the carbon footprint of the project.



# PROJECT TEAM

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**George Sutch**  
Sales Manager



**Paul Smith**  
Plant Operator



**Kara Lee**  
Key Accounts



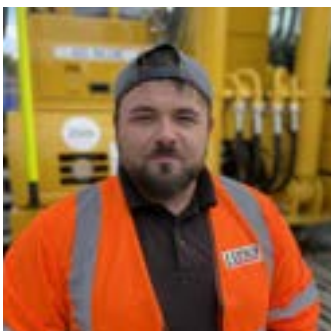
**Matthew Wilson**  
Transport  
Manager



**Chelsea Wright**  
Operator  
Recruiter



**Luke LeCoyte**  
Operations  
Manager



**James King**  
Technical Support  
Manager



**Paul Keenan**  
Head of Machine  
Control



**Paul Lynch**  
Head of  
Sustainability and  
HSQE

# TESTIMONIALS

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Paul Smith has been a Varied Plant Operator with Lynch for many years and worked on this job.

Paul's skills and abilities as an operator are superb, especially given the small footprint on the barge that he had to work in.

As the project progressed, and we were dredging and placing over 2800T of rock armour, Paul was pivotal to carrying out the works. He was dredging from the pontoon with a Long Reach Excavator, and then with a second pontoon, placing the rock armour using a 50T Heavy Excavator fitted with a rock grapple. Because we could only do one exercise at a time, Paul operated both machines.

Paul is one of the finest operators I have worked with.

Adrian Macdonald,  
BAM Nuttall Works  
Manager

By using the GPS Machine Control along with Leica Icon, we had instant feedback. This gave us the ability to constantly check the works as they were progressing. We could be sure that an area was correct before we installed rock bags and rock armour. This reduced unnecessary barge movements as we didn't need to go back over the areas previously dug.

We could use the data taken each day to compare against the design levels and sign off areas with the ECC Site Supervisor, ensuring quality work. A massive win was that the As-Built excavation line never really deviated from the design line. GPS was 100% the right choice and without it we wouldn't have been able to collect the quality of data we did.

The service from the Machine Control team was first class. We received remote support when we needed it which led to less downtime and James King was very knowledgeable and easy to get hold of. We had next to no downtime with the Excavators which led to us finishing ahead of schedule and beating the programme.

Tom Shilling,  
BAM Nuttall Lead  
Engineer







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